

# *Adhaerenseius floralis*, a new ascid genus and species (Acari: Parasitiformes: Ascidae) associated with *Poellnitzia rubriflora* (L. Bol) Uitewaal in the Western Cape Province of South Africa.

by

G. C. LOOTS and P. D. THERON

Department of Zoology, PU for CHE, Potchefstroom, 2520, RSA.

A new genus, *Adhaerenseius* and a new species *A. floralis* from South Africa is described in association with *Poellnitzia rubriflora*. A key to the new genus and 3 allied genera is given.

## INTRODUCTION

Members of the family Ascidae are often found on plants. In the Neotropical Region all the known members of the genus *Rhinoseius* Baker & Yunker are associated with flowers and are mainly transported by birds (Baker & Yunker 1964; Fain & Hyland 1980). In recent surveys of *Poellnitzia rubriflora* (Asphodelaceae) in the Western Cape Province a large number of a new ascid mite were found in the flowers of this plant where they seemingly feed on pollen. Observations made by the second author during the first week of December 1988 failed to prove avian or lepidopteran visitors to the flowers during that period which suggests that they are probably not phoretors to the mites. The anthesis flowers were, however, visited by two ant species, although no mites were found adhering to the ants.

Lindquist & Evans (1965) divided the subfamily Ascinae into three tribes on account of the following characteristics: position of the third pair of sternal pores, shape of the endopodal shield of the males, shape of the pilus dentilis and the number of teeth on the movable chela of the chelicera. The new species in question shares characteristics with three genera, viz. presence of ventrianal shield and setiform pilus dentilis with *Blattisocius* Keegan (tribe Blattisociini), reduced peritremal shield and rounded posterior margin of genital shield with *Melichares* Hering and *Rhinoseius* (tribe Melicharini) and deep lateral incisions on dorsal shield with *Rhinoseius*. The following characteristics merit creation of a new genus: the presence of a pair of sucker-like structures on the pygidium of the larva and protonymph, the dorsal chaetotaxy of the larva and protonymph, leg IV in the male armed with spurs, marked dimensional differences of dorsal setae between male and female and differences in leg chaetotaxy of genera III and IV.

The authors suggest that this new genus provisionally be contained in the tribe Blattisociini due to the absence of a ventral mucro on the movable digit of chelicera and the presence of a setiform pilus dentilis.

The female holotype and all paratypes of the new species are deposited in the mite collection of the Zoology Department, Potchefstroom University for CHE. Two female and 2 male paratypes are deposited in the National Collection of Acari, Plant Protection Research Institute, Pretoria.

**Genus *Adhaerenseius* gen. nov.**

Type-species: *Adhaerenseius floralis* **spec. nov.**

Etymology: *Adhaere* (L) = adhere, and *seius* = meaningful  
name: female gender

*Female*: Dorsal shield with lateral incisions, not covering entire dorsum, with 40 pairs of setae. Third pair of sternal pores situated together with metasternal setae on metasternal plates. Third pair of exopodal shields narrowly connected to peritremal shield. Anterior part of ventrianal shield much broader than posterior part, paranal setae situated in line with anterior margin of anal opening. With 7 rows of gnathosomal denticles, each row multi-denticulate; gnathotectum rounded, without denticles, pilus dentilis setiform, movable digit of chelicera edentate. Genu III with two posterolateral setae, genu IV with one posteroventral and two posterolateral setae.

*Male*: Dorsal shield with relatively small lateral incisions, majority of dorsal setae longer than distance between consecutive setal bases, alternatively with only a few long setae present, often with asymmetric distribution of dorsal setae, setae j<sub>1</sub> and j<sub>5</sub> minute, setae r<sub>2</sub> situated on dorsal shield. Sternogenital and ventrianal shields well separate. With a pair of membranous structures between corniculi and malae internae. Movable digit monodentate and with T-shaped spermadactyle. Leg IV of male armed with spurs.

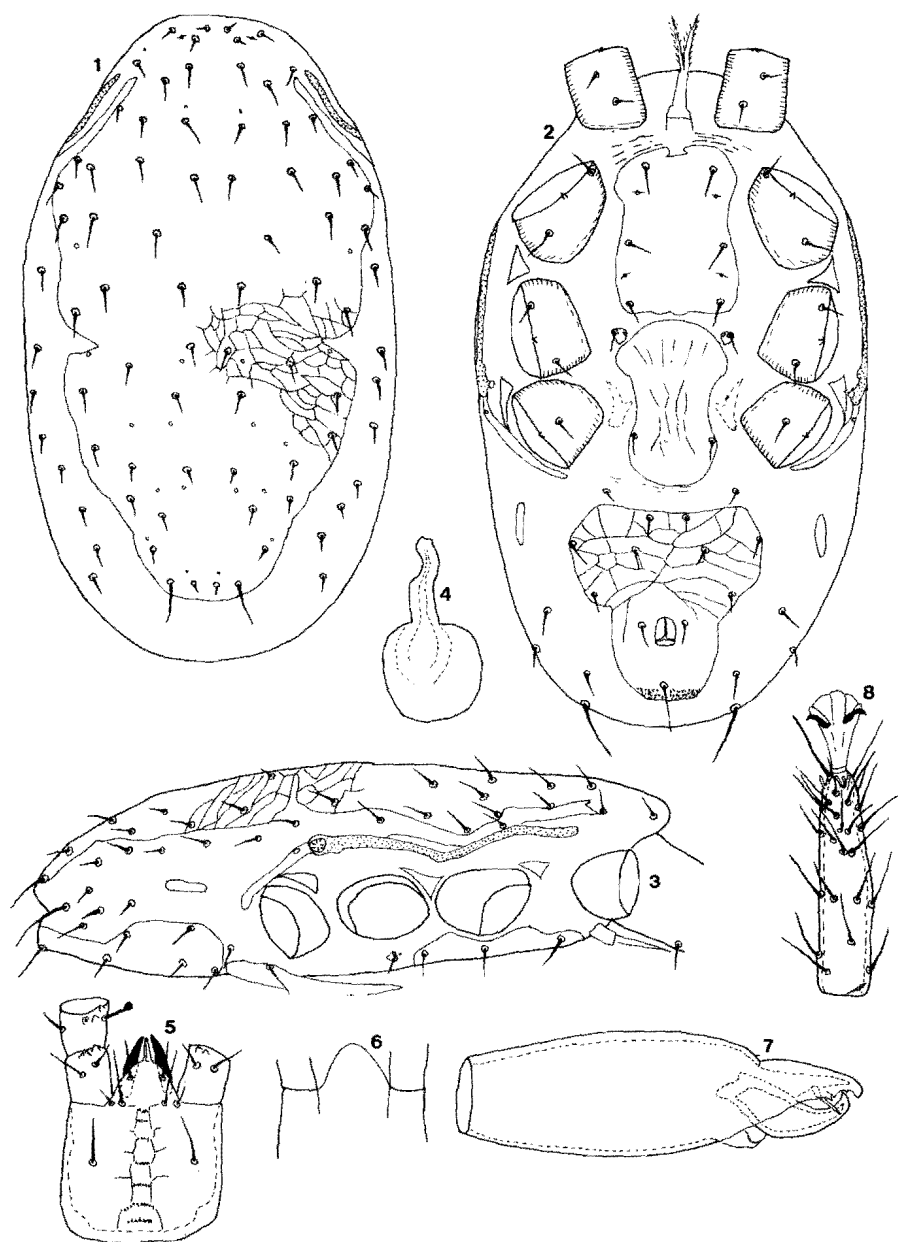
*Deutonymph*: Sternal shield weakly sclerotized, with one pair of paragenital pores, peritremal shields absent.

*Protonymph*: Dorsum covered by podonotal and pygidial shields and bears 28 pairs of setae of which 15 pairs are situated on the podonotum and 13 pairs on the opisthonotum. The podonotal shield bears 11 pairs of setae and the pygidial shield 7 pairs. Two conspicuous sucker-like structures present on posterior border of pygidial shield. Opisthogastric cuticle bears 4 pairs of setae instead of the 3 present in larva. Peritremes reach to middle of coxae III. Gnathotectum triangular.

*Larva*: Podonotal region of dorsum covered by a weakly sclerotized shield, bearing 8 pairs of setae. One pair of podonotal setae situated on cuticle. No pygidial shield discernible but this region bears 8 pairs of setae of which 3 are large and club-shaped. Posterior margin of idiosoma provided with sucker-like structures. Only discernible shield on venter is the small anal shield. Paranal setae situated in line with posterior margin of anal opening. Opisthogastric cuticle bears 3 pairs of setae and 3 pairs of pores.

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Figs. 1–8. *Adhaerenseius floralis* sp. nov., Female. 1: Dorsum. 2: Venter. 3: Idiosoma (lateral view). 4: Spermatheca. 5: Gnathosoma. 6: Gnathotectum. 7: Chelicera. 8: Tarsus I.



**Key to *Adhaerenseius* and three closely allied genera.**

- 1 With ventrianal shield ..... 2
- With anal shield only ..... 3
- 2 Metasternal setae and third pair of sternal pores situated on cuticle, female with genital shield truncate posteriorly, larva and protonymph without sucker-like structures on opisthonotum, leg IV of male not armed with spurs ..... *Blattisocius*
- Metasternal setae and third pair of sternal pores situated on metasternal shields, female with genital shield rounded posteriorly, leg IV of male armed with spurs ..... *Adhaerenseius*
- 3 Movable digit of chelicera edentate, dorsal shield with deep lateral incisions, setae z3 absent, metasternal plates always absent, male ventrianal shield narrow, leg II armed with spurs ..... *Rhinoseius*
- Movable digit of chelicera with 1–3 teeth, dorsal shield without lateral incisions, metasternal plates present or absent, male ventrianal shield relatively broad, leg II of male usually not armed with spurs ..... *Melichares*

***Adhaerenseius floralis* spec. nov., Figs 1–31****FEMALE** (Figs 1–8 and 26–30).

*Dimensions.* Length (excl. gnathosoma), 588  $\mu\text{m}$ ; breadth, 348  $\mu\text{m}$ ; length of dorsal shield, 539  $\mu\text{m}$ ; breadth, 294  $\mu\text{m}$ ; leg I, 411  $\mu\text{m}$ ; leg IV, 392  $\mu\text{m}$ ; length of ventrianal shield, 161  $\mu\text{m}$ ; breadth, 175  $\mu\text{m}$ ; length of genital shield, 147  $\mu\text{m}$ ; breadth, 74  $\mu\text{m}$ ; length of sternal shield, 142  $\mu\text{m}$ ; breadth, 91  $\mu\text{m}$ ; postanal seta, 32  $\mu\text{m}$ ; setae j1, 11  $\mu\text{m}$ ; setae r3, 20  $\mu\text{m}$ ; setae J5, 8  $\mu\text{m}$ ; setae Z5, 36  $\mu\text{m}$ .

*Dorsum.* Shield ornamented as depicted in Fig. 1, with lateral margins inconspicuous in podonotal region and irregular on opisthonotal region, j and z series of setae consisting of 6 setae and s and r series of 5 setae each, s5 and r1 absent with r5 and r6 (Fig. 3) on interscutal membrane. According to latter figure r2 also on membrane. Rows J, Z and S with 4 setae each, R row with 5 setae situated on interscutal membrane. Opisthonotum with setae J4, Z2, and S3 lacking, with R-series and UR1 situated on interscutal membrane. Dorsal shield with 10 pairs of pores.

*Venter.* Tritosternum with relative long base. Anterior margin of sternal shield indented (Fig. 2), provided with 2 pairs of slit-like pores, sternal setae relatively short. Peritremal shields much reduced (Fig. 3), weakly sclerotized with poststigmatal projection with a pore near stigmata. Peritremes reach anteriorly to near bases of setae s1. Exopodal shields represented by 3 pairs of small triangular platelets. Endopodal shields absent. Posterior and anterior margins of genital shield rounded, with few line ornamentations; paragenital pores absent, with lateral accessory sclerites (Fig. 2). Metapodal shields elongate. Opisthogaster, excluding circumanal setae, provided with 9 pairs of setae of which 4 pairs are situated on the ventrianal shield, anterior part of shield much broader than the posterior part and provided with line ornamentations (Fig. 2), paranal setae situated in line with anterior margin of anal opening, postanal seta twice as long as paranals and situated well removed from anus. Cribrum (Fig. 26) spiculate and without pores. Setae Jv5 more than twice the length of other opisthogastric setae.

*Spermatheca* (Fig. 4). Consists of a rounded sacculus connected to a broad, well sclerotized tubulus which opens on posterior part of coxa III.

*Gnathosoma.* Corniculi widely spaced basally, convergent distally (Fig. 5). Malae internae shorter than corniculi and spiculate. Salivary styli not discernible as

such. Gnathosomal setae subequal, second and third pairs adjacent, setae gs2 the shortest. Both trochanter and femur of palps provided with ventral projections; palp chaetotaxy normal for family, setae al-1 on femur and al-1 and al-2 on genu spatulate. Capitular groove (Fig. 27) provided with 7 rows of deutosternal denticles each bearing between 5-8 denticles except penultimate row which is much broader than the groove, bearing 18-20 denticles. Anterior margin of gnathotectum (Fig. 6) rounded and smooth. Movable digit of chelicera (Fig. 7) edentate, fixed digit with 3 teeth and well developed setiform pilus dentilis, dorsal seta (Fig. 28) minute and arthroal membrane at base of movable digit faintly fringed. Labrum smooth and separate from epipharynx (Fig. 29), paralabrum reduced and epipharynx (Fig. 30) provided with dorsal and 2 lateral rows of denticles, ventral side fitting into prebuccal cavity, denticulate.

*Legs.* Tarsus I (Fig. 8) distally with 4 obtuse sensory setae. Leg chaetotaxy normal for family except for genu III which bears 10 setae, setae pl-2 present and genu IV with 11 setae, setae pv-1 and pl-2 present.

## MALE (Figs 9-19)

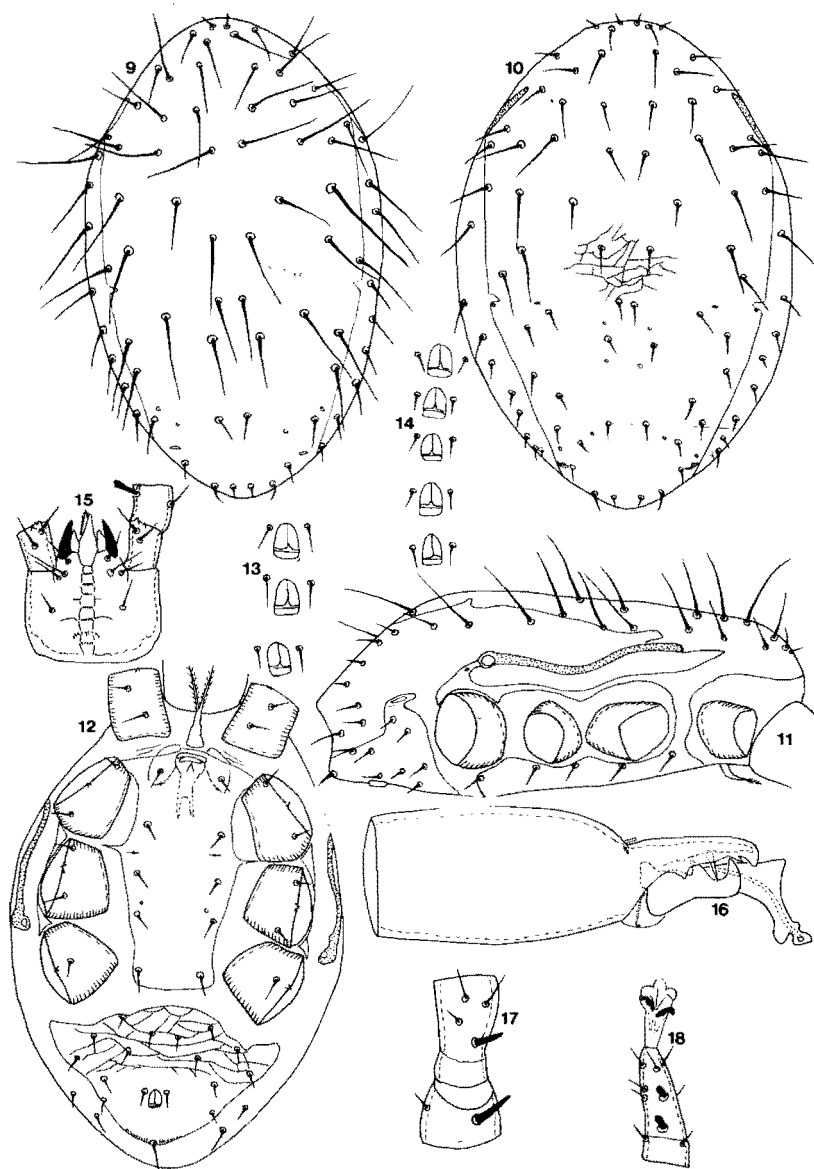
*Dimensions.* Length, 444  $\mu\text{m}$ ; breadth, 302  $\mu\text{m}$ ; leg I, 346  $\mu\text{m}$ ; leg IV, 404  $\mu\text{m}$ ; length of ventrianal shield, 124  $\mu\text{m}$ ; breadth, 205  $\mu\text{m}$ ; length of sternogenital shield, 223  $\mu\text{m}$ ; breadth, 78  $\mu\text{m}$ ; postanal seta, 25  $\mu\text{m}$ ; setae j1, 15  $\mu\text{m}$ ; setae r3, 41  $\mu\text{m}$ ; setae J5, 6  $\mu\text{m}$ ; setae Z5 of morphotype 1, 24  $\mu\text{m}$ ; morphotype 2, 14  $\mu\text{m}$ ; setae J1 of morphotype 1, 59  $\mu\text{m}$ ; morphotype 2, 23  $\mu\text{m}$ .

Dorsal shield (Figs 9-10) broader than in female, lateral incisions (Fig. 11) less prominent, dorsal chaetotaxy basically similar to that of female, two different morphotypes can be distinguished viz. morphotype 1 (Fig. 9) with only setae j1, J3, J5, S4, S5 and R-series relatively short with the majority of other setae longer than distance between consecutive setal bases. Morphotype 2 (Fig. 10) with all setae on opisthonotum shorter than distance between consecutive setal bases. In both morphotypes the majority of setae on podonotum longer than those of females. Porotaxy and line ornamentations as depicted in Fig. 10.

Genital opening (Fig. 12) situated near anterior margin of sternogenital shield, flanked by 2 ovoid incrassate areas, posterior margin of shield truncate. Exopodal shields (Fig. 11) continuous, fused posteriorly to poststigmatic peritremal projection and anteriorly to both sternal and dorsal shields. Anterior part of ventrianal shield (Figs 11-12) broad with an anteriorly directed projection on each side and bears 7 of the 9 pairs of opisthogastric setae, setae Jv5 not conspicuously longer than other setae, paranal setae of morphotype 1 (Fig. 13), situated in line with anterior margin of anus, in morphotype 2 (Fig. 14) the position varies from the middle of anus to linear with anterior margin.

Gnathosoma resembles that of female except for presence of a pair of lobe-like structures between corniculi and malae internae (Fig. 15). Movable digit of chelicera provided with one relatively large tooth and a stout T-shaped spermadactyle, fixed digit bidentate, dorsal seta and fringed arthroal membrane at base of movable digit stronger developed than in female.

Trochanter and femur I (Fig. 17) each with a thickened dorsal seta, tarsus II (Fig. 18) provided with 2 club shaped setae, femur, genu and tibia IV (Fig. 19) each with a ventral spur. The rest of the leg chaetotaxy similar to that of female.

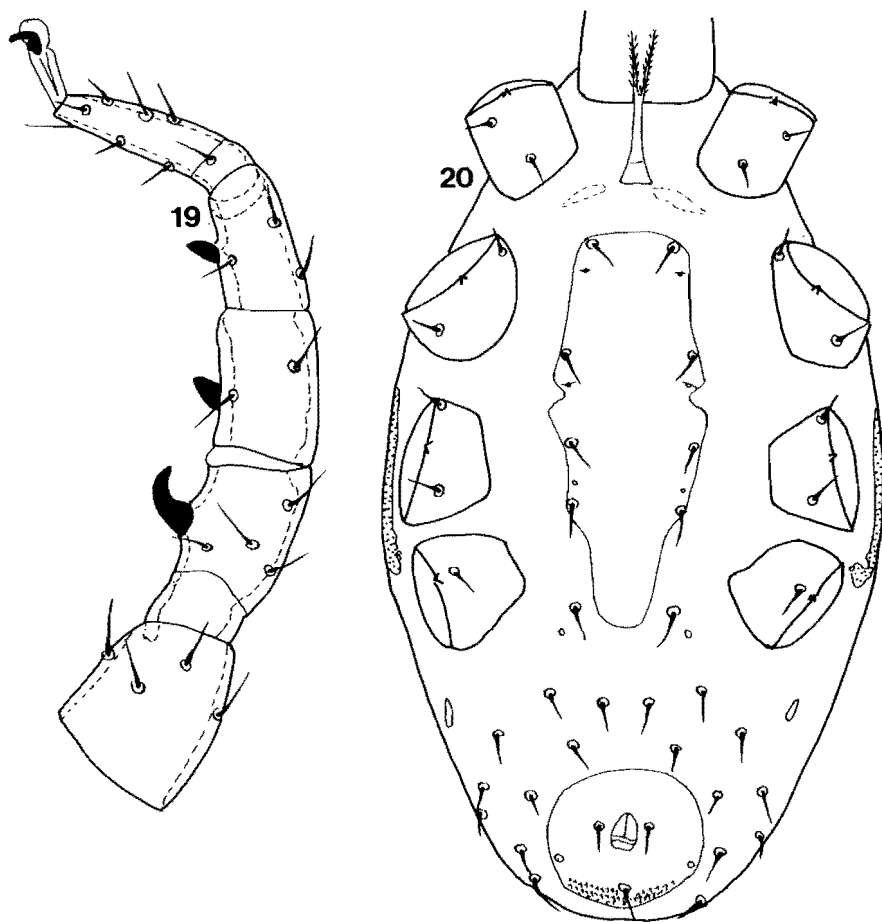


Figs. 9-18. *Adhaerenseius floralis* sp. nov., Male. 9: Dorsum (morphotype 1). 10: Dorsum (morphotype 2). 11: Idiosoma (lateral view). 12: Venter. 13: Paranal setae (morphotype 1). 14: Paranal setae (morphotype 2). 15: Gnathosoma. 16: Chelicera. 17: Trochanter and femur I. 18: Tarsus II.

**DEUTONYMPH** (Fig. 20)

*Dimensions.* Length, 411  $\mu\text{m}$ , breadth, 250  $\mu\text{m}$ ; leg I, 284  $\mu\text{m}$ , leg IV, 283  $\mu\text{m}$ ; length of dorsal shield, 395  $\mu\text{m}$ ; breadth, 240  $\mu\text{m}$ ; length of sternal shield, 210  $\mu\text{m}$ ; breadth, 80  $\mu\text{m}$ ; length of anal shield, 62  $\mu\text{m}$ ; breadth, 83  $\mu\text{m}$ ; postanal seta, 20  $\mu\text{m}$ ; setae j1, 10  $\mu\text{m}$ ; setae r3, 26  $\mu\text{m}$ ; setae J5, 6  $\mu\text{m}$ ; setae Z5, 32  $\mu\text{m}$ .

Dorsal chaetotaxy similar to that of female but with setae s1–4 and the entire r-series situated on interscutal membrane. Peritremes not fused to dorsal shield. A pair of weakly sclerotized platelets situated near base of tritosternum. Endopodal, exopodal and peritremal shields absent. Sternal shield with incision posterior to second pair of sternal pores. Paragenital pores present posterior to genital setae. Opisthogastric cuticle



Figs. 19–20. *Adhaerenseius floralis* sp. nov., 19: Leg IV of male. 20: Venter of deutonymph.

bears 9 pairs of setae. Anal shield relatively large, paranal setae situated in line with the middle of anus, with a pair of pores anterior to cribrum. Leg chaetotaxy similar to that of female.

### PROTONYMPH (Figs 21–23 and 31)

*Dimensions.* Length, 305  $\mu\text{m}$ ; breadth 204  $\mu\text{m}$ ; leg I, 249  $\mu\text{m}$ ; leg IV, 244  $\mu\text{m}$ ; length of podonotal shield, 193  $\mu\text{m}$ ; breadth, 146  $\mu\text{m}$ ; length of pygidial shield, 55  $\mu\text{m}$ ; breadth, 82  $\mu\text{m}$ ; length of sternal shield, 121  $\mu\text{m}$ ; breadth, 60  $\mu\text{m}$ ; length of anal shield, 42  $\mu\text{m}$ ; breadth, 49  $\mu\text{m}$ ; postanal seta, 13  $\mu\text{m}$ ; setae j1, 9  $\mu\text{m}$ ; setae r3, 15  $\mu\text{m}$ ; setae J5, 4  $\mu\text{m}$ ; setae Z5, 21  $\mu\text{m}$ .

Dorsum (Fig. 21) covered by podonotal and pygidial shields, podonotal shield provided with 11 pairs of setae and 2 pairs of pores, cuticle of podonotum with 4 pairs of r-setae. Pygidial shield with 7 pairs of setae, 2 prominent sucker-shape structures (Fig. 31) and a pair of slit-like pores. Cuticle between dorsal shields with 6 pairs of setae, 2 pairs of pores and 4 pairs of punctate areas. Sternal shield (Fig. 22) with 3 pairs of setae and 2 pairs of pores. Peritremes short, do not reach middle of coxae III. Genital setae situated immediately posterior to posterior margins of coxae IV. Opisthogastric cuticle with 4 pairs of setae and one pair of pores. Anal shield rounded, paranal setae situated in line with posterior margin of anus. Cribrum weakly developed. Gnathotectum (Fig. 23) triangular and not rounded as in other ontogenetic stages.

### LARVA (Figs 24–25)

*Dimensions.* Length, 281  $\mu\text{m}$ ; breadth, 192  $\mu\text{m}$ ; leg I, 216  $\mu\text{m}$ ; setae j1, 6  $\mu\text{m}$ ; setae s1, 14  $\mu\text{m}$ ; setae R3, 21  $\mu\text{m}$ ; setae J1, 6  $\mu\text{m}$ .

Dorsum provided with 17 pairs of setae (Fig. 24) of which 9 are situated on podonotum and 8 on opisthonotum; cuticle of podonotum provided with one pair of pores and one pair of setae. Podonotal shield weakly sclerotized, with an H-shape ornamentation, ending in 2 rounded, punctate areas. Pygidial region with 3 pairs of punctate areas, a pair of line ornamentations and a pair of sucker-like structures.

Podogastric cuticle with 3 pairs of setae, opisthogaster with 3 pairs of setae and 3 pairs of pores. Anal shield small, paranal setae situated in line with posterior border of anus.

**MATERIAL EXAMINED:** SOUTH AFRICA, Cape Province. Holotype female, 15 female and 8 male paratypes from anthesis flowers of *Poellnitzia rubriflora* near Bonnievale 33° 58' S 20° 02' E, 8–9.i.1987, G. F. Smith and G. J. Bredenkamp; 6 female, 8 male, 4 deutonymph, 4 protonymph and 6 larval paratypes, ditto, 2–5.xii.1988, P. D. Theron.

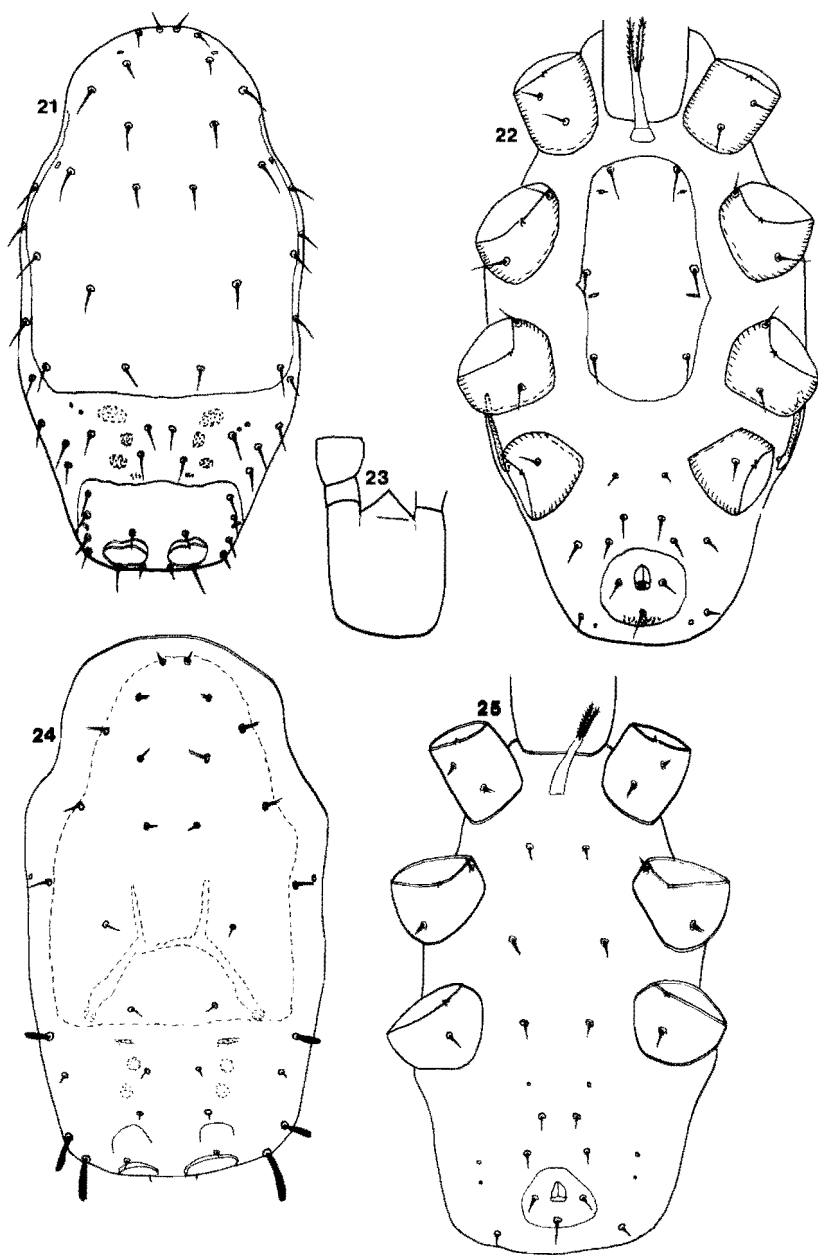
### REMARKS

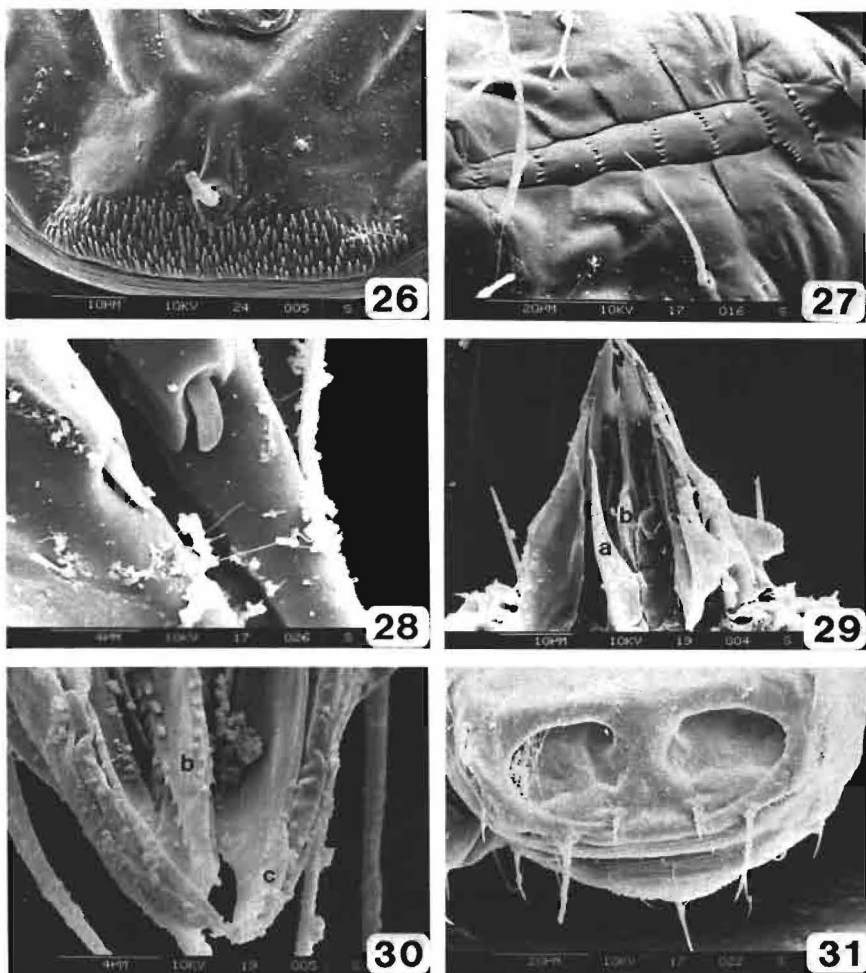
*Poellnitzia rubriflora* is an aberrant plant species which apparently attracts only few pollinating or potential pollinating agents. Its floral morphology suggests that free entry to the flower is only possible for micro-arthropods. It was observed that this ascid mite transported pollen out of the flower capsule probably facilitating pollination in the

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Figs. 21–25. *Adhaerenseius floralis* sp. nov., 21: Dorsum of protonymph. 22: Venter of protonymph. 23: Gnathotectum of protonymph. 24: Dorsum of larva. 25: Venter of larva.







Figs. 26–31. *Adhaerenseius floralis* sp. nov., 26: Cribrum of female. 27: Deutosternal denticles of female. 28: Dorsal chelicera setae of female. 29: Labrum (a) and epipharynx (b) of female. 30: Epipharynx (b) and corniculus (c) of female. 31: Sucker-like structures of protonymph.

process. No mites were found in flower capsules of plants grown in a green house in Potchefstroom and these plants were not pollinated. As yet no evidence exists as to whether birds or insects act as phoretors for this mite species, which appears to be one of only few ascid species to have adapted to polleniphagy.

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